

## **J. E. Martínez-Legaz - Curriculum Vitae**

Date and place of birth: March 26, 1951; Barcelona, Spain

### Qualifications

1973 B. Sc. (Mathematics), Universitat de Barcelona

1981 Ph. D. (Mathematics), Universitat de Barcelona

1986 Associate Professor (Applied Mathematics), Universitat de Barcelona

1992 Associate Professor (Foundations of Economic Analysis), Universitat Autònoma de Barcelona

1993 Full Professor (Foundations of Economic Analysis), Universitat Autònoma de Barcelona

### Employment history and current appointment

1977-1986 Universitat de Barcelona, Departament d'Equacions Funcionals (changed to Departament de Matemàtica Aplicada i Anàlisi), assistant professor

1986-1990 Universitat de Barcelona, Departament de Matemàtica Aplicada i Anàlisi, associate professor

1990-1993 Universitat Autònoma de Barcelona, Departament d'Economia i d'Història Econòmica, associate professor

1993-..... Universitat Autònoma de Barcelona, Departament d'Economia i d'Història Econòmica, full professor

### Supervision

Supervised 3 PhD students in Mathematics (Universitat de Barcelona) and 2 PhD students in Economics (Universitat Autònoma de Barcelona, Università degli Studi di Bergamo)

## Honors

Doctor Honoris Causa, Universidad Nacional de Ingeniería (Lima, Peru, 2011)  
EUROPT Fellow 2011

## Research Grants

1990-1993 DGICYT Grant, Optimization in Economic Models (main researcher: M. S. Santos)

1993-1996 DGICYT Grant, Supermodular Functions in Economic Analysis: Indivisibilities and Nonconvexity (main researcher: J. E. Martínez-Legaz)

1996-1999 DGES Grant, Convexity and Indivisibilities in Cooperative Games: Theory and Economic Applications (main researcher: J. E. Martínez-Legaz)

1999-2002 CICYT Grant, Cooperative Games and Economic Structures: Convexity, Monotonicity and Generalizations (main researcher: J. E. Martínez-Legaz)

2002-2005 MCYT Grant, Convexity and indivisibilities in exchange, assignment, demand and production problems (main researcher: J. E. Martínez-Legaz)

2005-2008 MEC Grant, Convexity and monotonicity. Applications to Optimization Theory (main researcher: J. E. Martínez-Legaz)

2008-2011 MEC Grant, Models of Convex Analysis. Tame Optimization and applications (main researcher: A. Daniilidis)

2012-2014 MICINN Grant, Variational Optimization: Structure and Duality (main researchers: A. Daniilidis, J. E. Martínez-Legaz)

2014-2016 Australian Research Council's Discovery Projects funding scheme project number DP140103213 (main researcher: A. Bagirov)

2015-2018 MICINN Grant, Advances in the Variational Study of Optimization Problems (Main researcher: J. Parra)

## Memberships

1991-... Editorial Board of Optimization (Taylor & Francis Ltd)

1994-... Editorial Board of the Journal of Convex Analysis (Heldermann Verlag)

2000-... Editorial Board of the Journal of Global Optimization (Springer)

2001-2005 Editorial Board of the Journal of Systems Science and Complexity (Science Press and Allerton Press)

2001-... Editorial Board of TOP (Sociedad Española de Estadística e Investigación Operativa)

2001-... Editorial Board of Cuadernos Aragoneses de Economía (Facultad de Ciencias Económicas y Empresariales de la Universidad de Zaragoza)

2009-2014 Editorial Board of Set-Valued and Variational Analysis Theory and Applications (Springer)

2009-... Editorial Board of the International Journal of Optimization: Theory, Methods and Applications (Global Information Publisher)

2010-2014 Editorial Board of the Taiwanese Journal of Mathematics (The Mathematical Society of the Republic of China)

2010-... Editorial Board of the International Journal of Operations Research (Operations Research Society of Taiwan)

2011-... Editorial Board of the PanAmerican Mathematical Journal (International Publications)

2011-... International Journal of Engineering, Contemporary Mathematics and Sciences (2011-...)

2012-... Editorial Board of the Journal of Optimization Theory and Applications (Springer)

2012-... Editorial Board of the Caspian Journal of Mathematical Sciences (University of Mazandaran)

2013-... Editorial Board of the Transactions on Mathematical Programming and Applications (International Publications)

2013-... Journal of Information and Optimization Sciences (Taylor & Francis Ltd)

2014-... Minimax Theory and its Applications (Heldermann Verlag)

2014-... Iranian Journal of Operations Research (Iranian Operations Research Society)

2006-2012 Editor-in-Chief of Optimization (Taylor & Francis Ltd)

1994-2006 International Scientific Committee of the international Working Group on Generalized Convexity

2000-2002 Chairman of the international Working Group on Generalized Convexity

## Conference Committees

Third Franco-Latinamerican Conference in Applied Mathematics and First Chile-CEE School on Optimization (Santiago, Chile, 1992)

5th International Symposium on Generalized Convexity (Marseille-Luminy, France, 1996)

6th International Symposium on Generalized Convexity/Monotonicity (Karlovasi, Greece, 1999)

7th International Symposium on Generalized Convexity/Monotonicity (Hanoi, Vietnam, 2002)

VI Seminario Internacional de Optimización y Áreas Afines (Lima, Peru, 2003)

Sixth International Conference of the Association of Asia-Pacific Operational Research Societies within IFORS (New Delhi, India, 2003)

12th French-German-Spanish Conference on Optimization (Avignon, France, 2004)

Jornada Economía y Matemáticas (Alicante, Spain, 2005)

8th Symposium on Generalized Convexity and Generalized Monotonicity (Varese, Italy, 2005)

VII Seminario Internacional en Optimización y Áreas Afines (Lima, Peru, 2005)

CODE 2007: Conférence de la SMAI sur l'optimisation et la décision (Paris, France, 2007)

The Second International Conference on Optimization and Optimal Control (Ulaanbaatar, Mongolia, 2007)

VIII Seminario Internacional en Optimización y Áreas Afines (Lima, Peru, 2007)

The International Conference on Nonconvex Programming: Local and Global Approaches (Rouen, France, 2007)

International Symposium on Variational Analysis and Optimization (Kaohsiung, Taiwan, 2008)

The 2009 International Joint Conference on Computational Sciences and Optimization (Sanya, China, 2009)

The 2nd International Conference on Nonlinear Analysis and Optimization (Isfahan, Iran, 2009)

The First World Congress on Global Optimization in Engineering & Science (Changsha, China, 2009)

IX International Seminar in Optimization and Related Areas (Lima, Peru, 2009)

UNESCO-VIETNAM School on Variational inequalities and related problems (Hanoi, Vietnam, 2010)

Parametric Optimization and Related Topics X (Karlsruhe, Germany, 2010)

Workshop of Computational Optimization (Wisła, Poland, 2010)

International Colloquium on Optimization in Honor of Professor Michel Volle (Avignon, France, 2010)

Workshop on Computational Optimization (WCO'2011) (Szczecin, Poland, 2011)

X International Seminar in Optimization and Related Areas (Lima, Peru, 2011)

Training Programme on Optimization and Its Applications (Delhi, India, 2012)

(OPTIMA-2012) International Conference on Optimization Modelling and Applications (Delhi, India, 2012)

International Conference on Operations Research and Optimization (Tehran, Iran, 2013)

X International Seminar in Optimization and Related Areas (Lima, Peru, 2013)

11th International Conference on Approximation and Optimization in the Caribbean (Puebla, Mexico, 2013)

International Workshop and Summer School on Variational Analysis and Approximation Theory (Hanoi, Vietnam, 2014)

The Fourth Asian Conference on Nonlinear Analysis and Optimization (Taipei, Taiwan, 2014)

The First Pacific Optimization Conference (POC2014) (Wuxi, China, 2014)

International Workshop on Some Selected Problems in Optimization and Control Theory (Hanoi, Vietnam, 2015)

International Conference on Modeling, Simulation and Optimizing Techniques (Jalandhar, India, 2015)

International Workshop on Machine learning, Optimization and big Data - MOD 2015 (Taormina, Italy, 2015)

International Symposium on Foundations and Applications of Big Data Analytics - FAB 2015 (Paris, France, 2015)

14th EUROPT Workshop on Advances in Continuous Optimization (Warsaw, Poland, 2016)

## Organization of conferences and workshops

Jornades Catalanes de Matemàtica Aplicada (Gerona, Spain, 1994), jointly with D. Azé, G. Gómez, Ch. Horvath and M. Sainz

Cluster of sessions at the 16th International Symposium on Mathematical Programming (Lausanne, Switzerland, 1997)

CODE Workshop on Generalized Convexity and Monotonicity in Economic Modeling (Bellaterra, Spain, 1998), jointly with I. Fradera

Workshop on Mathematical Programming, Games and Networks (Aix-en-Provence, France, 2000), jointly with F. Bloch and A. Soubeyran

Workshop on Mathematical Programming, Games and Networks (Aix-en-Provence, France, 2001), jointly with F. Bloch and A. Soubeyran

II Conference on "Behavioral Learning and Bounded Rationality (Aix-en-Provence, France, 2002), jointly with B. Sinclair-Desgagné, B. McLeod and A. Soubeyran

LEA Workshop on "Optimization, Games and Economic Applications" (Bellaterra, Spain, 2002), jointly with A. Soubeyran

VI Workshop on "Optimisation-Games-Networks and Applications" (Aix-en-Provence, France, 2003), jointly with B. Cornet and A. Soubeyran

LEA Workshop on "Optimization, Games and Economic Applications" (Bellaterra, Spain, 2005), jointly with A. Soubeyran and H. Stahn

Workshop on "Behavioral Economics in the Light of Mathematics, Psychology, Cognition and Bio Informatics" (Aix-en-Provence, France, 2006), jointly with A. Soubeyran and H. Stahn

International Conference on Nonsmooth and Variational Analysis in Sciences and Engineering (Limoges, France, 2007), jointly with S. Adly, J. Guillerme and J.-B. Hiriart-Urruty

Advanced Course on Optimization: Theory, Methods, and Applications (Bellaterra, Spain, 2009), jointly with A. Daniilidis

International Conference on Advances in Optimization and Related Topics (Bellaterra, Spain, 2010), jointly with A. Daniilidis and A. Ferrer

Cluster of sessions at EURO XXV 2012 (Vilnius, Lithuania, 2012), jointly with A. Kruger, B. Mordukhovich and G. W. Weber

12th EUROPT Workshop on Advances in Continuous Optimization (Perpignan, France, 2014), jointly with D. Aussel, T. Bayen, A. Ferrer and M. Mongeau

Talks presented at conferences and workshops

*1981*

Optimization. Theory and Algorithms (Confolant, France)

*1982*

IX Jornadas Matemáticas Hispano-Lusas (Salamanca, Spain)

XI International Symposium on Mathematical Programming (Bonn, Germany)

1983

XI IFIP Conference on System Modelling and Optimization (Copenhagen, Denmark)

VIII Symposium on Operations Research (Karlsruhe, Germany)

*1984*

IX Symposium on Operations Research (Osnabrück, Germany)

*1985*

Journées Fermat 85 (Toulouse, France)

X Symposium on Operations Research (Munich, Germany)

*1986*

4th French-German Conference on Optimization (Irsee, Germany) International Conference on Vector Optimization (Darmstadt, Germany)

Journées Montpellier-Perpignan (Seminaire d'Analyse Convexe) (Montpellier, France)

XII International Conference on Mathematical Optimization-Theory and Applications (Eisenach, German Democratic Republic)

*1987*

29th Annual Conference of the Operational Research Society (Edinburgh, United Kingdom)

XIII International Conference on Mathematical Optimization-Theory and Applications (Eisenach, German Democratic Republic)

*1988*

International Workshop on Generalized Concavity, Fractional Programming and Economic Applications (Pisa, Italy)

33 Internationales Wissenschaftliches Kolloquium (Ilmenau, German Democratic Republic)

*1989*

Colloque International Théorie du Point Fixe et Applications (Marseille-Luminy, France)

XIV International Conference on Mathematical Optimization-Theory and Applications (Eisenach, German Democratic Republic)

*1990*

3rd ECCO Meeting (Barcelona, Spain)

The Fourth Annual Meeting of the International Workshop in Analysis and Its Applications (Kupari, Yugoslavia)

IX International Conference on Multiple Criteria Decision Making (Fairfax, U.S.A.)

*1991*

NATO Advanced Study Institute "Approximation Theory, Spline Functions and Applications" (Maratea, Italy)

Nonsmooth Optimization. Methods and Applications (Erice, Italy)

XVI Simposio de Análisis Económico (Bellaterra, Spain)

*1992*

Seminar on Nonconventional Preference Modelling (Alicante, Spain)

1st Meeting of the Society for Social Choice and Welfare (Caen, France)

Convergences en Analyse Multivoque et Unilatérale (Marseille-Luminy, France)



3rd Franco-Latinamerican Conference in Applied Mathematics and First Chile-CEE School on Optimization (Santiago, Chile)  
1st MODE Meeting (Perpignan, France)  
XVII Simposio de Análisis Económico (Bellaterra, Spain)

*1993*

Journées Inter-Universitaires Analyse Convexe et Probabilités (Marrakech, Morocco)  
XIII World Conference on Operations Research (Lisbon, Portugal)  
International Conference on Applied Analysis (Hanoi, Vietnam)  
ASSET Meeting 1993 (Barcelona, Spain)  
XVIII Simposio de Análisis Económico (Bellaterra, Spain)

*1994*

15th International Symposium on Mathematical Programming (Ann Arbor, U.S.A.)  
XIX Simposio de Análisis Económico (Bellaterra, Spain)

*1995*

3èmes Journées d'Analyse Non Linéaire de l'Université Cadi Ayyad (Marrakech, Morocco)  
Workshop on Nonsmooth Analysis and Its Applications (Pau, France)  
Workshop on New Directions in the Theory of Markets and Games (Toronto, Canada)  
Spanish-Russian Meetings on Games and Decisions (Bellaterra, Spain)  
2nd Catalan Days on Applied Mathematics (Font Romeu - Odeillo, France)  
XX Simposio de Análisis Económico (Bellaterra, Spain)

*1996*

Journées d'Analyse Numérique et Optimisation (Meknès, Morocco)  
5th International Symposium on Generalized Convexity (Marseille-Luminy, France)  
III Catalan Days on Applied Mathematics (Lérida, Spain)  
XXI Simposio de Análisis Económico (Bellaterra, Spain)

*1997*

INFORMS San Diego Spring (San Diego, U.S.A.)

Workshop on Scheduling & Heuristic Search (Riverside, U.S.A.)

16th International Symposium on Mathematical Programming (Lausanne, Switzerland)

XXII Simposio de Análisis Económico (Bellaterra, Spain)

*1998*

Workshop on Game Theory (Bilbao, Spain)

IV Catalan Days of Applied Mathematics (Tarragona, Spain)

International Conference on Public Economic Theory (Tuscaloosa, U.S.A.)

3rd Spanish Meeting on Game Theory and Applications (Barcelona, Spain)

INFORMS International Israel (Tel Aviv, Israel)

*1999*

XIV International Conference on Mathematical Programming (Mátraháza, Hungary)

6th International Symposium on Generalized Convexity/Monotonicity (Karlovasi, Greece)

Conference on Duality and Games (Aix-en-Provence, France)

XXIV Simposio de Análisis Económico (Bellaterra, Spain)

*2000*

INFORMS Spring 2000 (Salt Lake City, U.S.A.)

The Ninth International Colloquium on Numerical Analysis and Computer Science with Applications (Plovdiv, Bulgaria)

Workshop on Mathematical Programming, Games and Networks (Aix-en-Provence, France)

*2001*

Journée Limoges - Barcelone (Limoges, France)

Seminario Internacional en Optimización y Áreas Afines (Lima, Peru)

*2002*

Dixièmes Journées du Groupe MODE (Montpellier, France)

XX Coloquio de la Sociedad Matemática Peruana (Lima, Peru)

*2003*

Mini-symposium Convexit  g n ralis e (Perpignan, France)

12th European Workshop on General Equilibrium Theory (Bielefeld, Germany)

IX Workshop on Well-Posedness in Optimization (Marseille, France)

Seminario Internacional de Optimizaci n y  reas Afines (Lima, Peru)

XXI Coloquio de la Sociedad Matem tica Peruana (Arequipa, Peru)

V Encuentro Nacional en Educaci n Matem tica (Pucallpa, Peru)

VI Workshop on "Optimisation-Games-Networks and Applications" (Aix-en-Provence, France)

*2004*

I Jornadas SEIO - RSME sobre Programaci n Matem tica (Elche, Spain)

12th French-German-Spanish Conference on Optimization (Avignon, France)

*2005*

Journ e Th matique Quasiconvexit  (Montpellier, France)

8th International Symposium on Generalized Convexity and Generalized Monotonicity (Varese, Italy)

VII Seminario Internacional en Optimizaci n y  reas Afines (Lima, Peru)

Jornadas de Trabajo - Optimizaci n, Noviembre 2005 (Madrid, Spain)

Function Theory on Infinite Dimensional Spaces IX (Madrid, Spain)

*2006*

The International Conference on Nonlinear Programming with Applications (NPA2006) (Shanghai, China)

INTAS Summer School Nonlinear analysis with applications in Economics, Energy and Transportation (Bergamo, Italy)

GREQAM Summer School Rationality, Social Learning and Complexity (Aix-en-Provence, France)

Workshop "D as de Optimizaci n" (Cholula, Mexico)

Iberian Conference in Optimization (Coimbra, Portugal)

5th Ballarat Workshop on Global and Non-Smooth Optimization: Theory, Methods and Applications (Ballarat, Australia)

International Conference on Mathematics - IMCA 2006 (Lima, Peru)

*2007*

International Conference on Nonlinear Analysis and Optimization (Isfahan, Iran)

15th International Scientific Conference on Mathematical Methods in Economics and Industry (Herľany, Slovakia)

The Second International Conference on Optimization and Optimal Control (Ulaanbaatar, Mongolia)

11-th Workshop on Well-Posedness of Optimization Problems and Related Topics (Alicante, Spain)

VIII Seminario Internacional en Optimización y Áreas Afines (Lima, Peru)

XXV Coloquio de la Sociedad Matemática Peruana (Lima, Peru)

Seminario de Optimización y Análisis Variacional (Elche, Spain)

*2008*

International Conference on Modeling, Computation and Optimization (Delhi, India)

Seminario Taller "Avances en Matemáticas Aplicadas (Cali, Colombia)

Ninth International Conference "Approximation and Optimization in the Caribbean" (San Andres Island, Colombia)

The Second International Conference on Nonlinear Programming with Applications 2008 (Beijing, China)

48th Workshop: Nonsmooth Analysis Optimization and Applications (Erice, Italy)

5th Workshop on Vector Optimization and Related Topics (Madrid, Spain)

9th International Symposium on Generalized Convexity and Generalized Monotonicity (Kaohsiung, Taiwan)

39th Annual Iranian Mathematics Conference (Kerman, Iran)

International Symposium on Variational Analysis and Optimization (Kaohsiung, Taiwan)

9th International Conference on Numerical Analysis and Optimization (Mohammedia, Morocco)

*2009*

The 2009 International Symposium on Optimization Theory, Methods and Applications (Sanya, China)

The 2nd International Conference on Nonlinear Analysis and Optimization (Isfahan, Iran)

VIII Brazilian Workshop on Continuous Optimization (Mambucaba, Brazil)

IX International Seminar in Optimization and Related Areas (Lima, Peru)

IV Simposio Internacional de Teoría de Aproximación y temas afines (Puebla, Mexico)

*2010*

International Conference on Optimization and Its Applications (Varanasi, India)

Workshop on Functional Analysis and Optimization (Seville, Spain)

2010 Chinese Symposium on Mathematical Programming (Shanghai, China)

International Functional Analysis Meeting (Valencia, Spain)

4th Workshop on Optimization and Variational Analysis (Elche, Spain)

24th Mini EURO Conference on Continuous Optimization and Information-Based Technologies in The Financial Sector (Izmir, Turkey)

Colloquium on Optimization in Honor of Professor Michel Volle (Avignon, France)

*2011*

Seminario de Matemáticas (Elche, Spain)

XX European Workshop on General Equilibrium Theory (Baiona, Spain)

III Alicante - Elche - Limoges Meeting on Optimization (Castro Urdiales, Spain)

The 9th EUROPT Workshop on Advances in Continuous Optimization (Balarat, Australia)

X International Seminar in Optimization and Related Areas (Lima, Peru)

Seventh French-Chilean days of Optimization (JFCO-7) (Perpignan, France)

International Conference on: Numerical Analysis and Optimization - Theory and Applications (Dhahran, Saudi Arabia)

*2012*

Conférence MODE 2012 - Dijon. Mathématiques de l'Optimisation et de la décision (Dijon, France)

58th Course: Variational Analysis and Applications (Erice, Italy)

A tribute to Antoine Soubeyran (Aix-en-Provence, France)

Italian Spanish Workshop on Optimization (Milan, Italy)  
17th International Conference on Mathematical Methods in Economy and Industry (Berlin, Germany)  
(OPTIMA-2012) International Conference on Optimization Modelling and Applications (Delhi, India)

*2013*

International Conference on Operations Research and Optimization (Tehran, Iran)  
XXII European Workshop on General Equilibrium Theory (Vienna, Austria)  
5th Seminar on Optimization and Variational Analysis: Stability and Multi-Criteria Decision (Elche, Spain)  
Journée d'Analyse Convexe et Optimisation (El Jadida, Morocco)  
XI International Seminar on Optimization and Related Areas (Lima, Peru)  
The 9th International Conference on Optimization: Techniques and Applications (Taipei, Taiwan)

*2014*

International Workshop and Summer School on Variational Analysis and Approximation Theory (Hanoi, Vietnam)  
6th Seminar on Optimization and Variational Analysis (Elche, Spain)  
The fifth annual meeting of the "Lebanese Society for the Mathematical Sciences" LSMS-2014 (Beirut, Lebanon)  
Summer Workshop in Economic Theory S W E T 2014 (Paris, France)  
12th EUROPT Workshop on Advances in Continuous Optimization (Perpignan, France)  
The Fourth Latin American Workshop on Optimization and Control - LAWOC 2014 (Lima, Peru)  
ICM Satellite Conference 2014: The Fourth Asian Conference on Nonlinear Analysis and Optimization (Taipei, Taiwan)  
III Colóquio de Matemática da Região Norte (Manaus, Brazil)  
Journées annuelles 2014 du GdR MOA (Limoges, France)

*2015*

International Workshop on Evolution Problems and Optimization (Agadir, Morocco)

Workshop on Challenges of Continuous Optimization in Theory and Applications (Groningen, The Netherlands)

Third International Conference on Nonlinear Analysis and Optimization (Isfahan, Iran)

Workshop on Generalised Convexity and Set Computation (London, United Kingdom)

Variational Analysis and Applications (Erice, Italy)

39th AMASES Meeting (Padova, Italy)

XII International Seminar on Optimization and Related Areas (Lima, Peru)

*2016*

South Pacific Optimization Workshop SPOW 2016 (Nouméa, New Caledonia, France)

Optimal Transportation, Equilibrium, and Applications to Economics (OTEAE) Workshop (New York, U.S.A.)

XI Brazilian Workshop on Continuous Optimization (Manaus, Brazil)

7th International Seminar on Optimization and Variational Analysis (Alicante, Spain)

14th EUROPT Workshop on Advances in Continuous Optimization (Warsaw, Poland)

## Publications

Goberna, M. A.; Martínez-Legaz, J. E.; Vera de Serio, V. N.: The Voronoi inverse mapping. *Linear Algebra Appl.* 504 (2016), 248–271.

Hadjisavvas, N.; Jacinto, F. M. O.; Martínez-Legaz, J. E.: Some conditions for maximal monotonicity of bifunctions. *Set-Valued Var. Anal.* 24 (2016), no. 2, 323–332.

Elias, L. M.; Martínez-Legaz, J. E.: A simplified conjugation scheme for lower semi-continuous functions. *Optimization* 65 (2016), no. 4, 751–763

Burachik, R.S.; Martínez-Legaz, J. E.; Rezaie, M.; Théra, M.: An Additive Subfamily of Enlargements of a Maximally Monotone Operator. *Set-Valued Var. Anal.* 23 (2015), no. 4, 643–665.

Volle, M.; Martínez-Legaz, J. E.; Vicente-Pérez, J.: Duality for closed convex functions and evenly convex functions. *J. Optim. Theory Appl.* 167 (2015), no. 3, 985–997.

Martínez-Legaz, J. E.; Rocco, M.: On a surjectivity-type property for maximal monotone operators. *Pac. J. Optim.* 11 (2015), no. 3, 449–457.

Martínez-Legaz, J. E.: Optimality conditions for pseudoconvex minimization over convex sets defined by tangentially convex constraints. *Optim. Lett.* 9 (2015), no.5, 1017–1023.

Bonenti, F.; Martínez-Legaz, J. E.: On the existence of a saddle value. *J. Optim. Theory Appl.* 165 (2015), no. 3, 785–792.

Martínez-Legaz, J. E.: The contribution of K.-H. Elster to generalized conjugation theory and nonconvex duality. *Optimization* 64 (2015), no. 1, 87–96.

Martínez-Legaz, J. E.: Integration of the Fenchel subdifferentials revisited. *Vietnam J. Math.* 42 (2014), no. 4, 533–542.



Iusem, A. N.; Martínez-Legaz, J. E.; Todorov, M. I.: Motzkin predecomposable sets. *J. Global Optim.* 60 (2014), no. 4, 635–647.

Bueno, O.; Martínez-Legaz, J. E.; Svaiter, B. F.: On the monotone polar and representable closures of monotone operators. *J. Convex Anal.* 21 (2014), no. 2, 495–505.

Martínez-Legaz, J. E.; Todorov, M. I.; Zetina, C. A.:  $\gamma$ -active constraints in convex semi-infinite programming. *Numer. Funct. Anal. Optim.* 35 (2014), no. 7-9, 1078–1094.

Martínez-Legaz, J. E.: On Weierstrass extreme value theorem. *Optim. Lett.* 8 (2014), no. 1, 391–393.

Hantoute, A.; Martínez-Legaz, J. E.: Characterization of Lipschitz continuous difference of convex functions. *J. Optim. Theory Appl.* 159 (2013), no. 3, 673–680.

Goberna, M.A.; Iusem, A., Martínez-Legaz, J. E., Todorov, M.I.: Motzkin decomposition of closed convex sets via truncation. *J. Math. Anal. Appl.* 400 (2013), no. 1, 35–47.

García Ramos, Y.; Martínez-Legaz, J. E.; Simons, S.: New results on  $q$ -positivity. *Positivity* 16 (2012), no. 3, 543–563.

Martínez-Legaz, J. E.; Vicente-Pérez, J.: Lexicographical representation of convex sets. *J. Convex Anal.* 19 (2012), no. 2, 485–496.

Martínez-Legaz, J. E.; Martínón, A.: On the infimum of a quasiconvex vector function over an intersection. *TOP* 20 (2012), no. 2, 503–516.

Mohebi, H.; Martínez-Legaz, J. E.; Rocco, M.: Some criteria for maximal abstract monotonicity. *J. Global Optim.* 53 (2012), no. 2, 137–163

Bilbao, J.M.; Martínez-Legaz, J. E.: A convex representation of totally balanced games. *J. Math. Anal. Appl.* 387 (2012), no. 2, 1167–1175.

Martínez-Legaz, J. E.; Martínón, A.: On the infimum of a quasiconvex function over an intersection. Application to the distance function. *J. Convex Anal.* 18 (2011), no. 3, 687–698.

Ginchev, I.; Martínez-Legaz, J. E.: Characterization of d.c. functions in terms of quasidifferentials. *Nonlinear Anal.* 74 (2011), no. 17, 6781–6787.

Rocco, M.; Martínez-Legaz, J. E.: On surjectivity results for maximal monotone operators of type (D). *J. Convex Anal.* 18 (2011), no. 2, 545–576.

Martínez-Legaz, J. E.; Vicente-Pérez, J.: The e-support function of an e-convex set and conjugacy for e-convex functions. *J. Math. Anal. Appl.* 376 (2011), no. 2, 602–612.

Burachik, R. S.; Martínez-Legaz, J. E.; Rocco, M.: On a sufficient condition for equality of two maximal monotone operators. *Set-Valued Var. Anal.* 18 (2010), no. 3-4, 327–335.

Goberna, M. A.; Martínez-Legaz, J. E.; Todorov, M. I.: On Motzkin decomposable sets and functions. *J. Math. Anal. Appl.* 372 (2010), no. 2, 525–537.

Goberna, M. A.; González, E.; Martínez-Legaz, J. E.; Todorov, M. I.: Motzkin decomposition of closed convex sets. *J. Math. Anal. Appl.* 364 (2010), no. 1, 209–221.

Martínez-Legaz, J. E.: On maximally  $q$ -positive sets. *J. Convex Anal.* 16 (2009), no. 3-4, 891–898.

Martínez-Legaz, J. E.: What is invexity with respect to the same  $\eta$ ? *Taiwanese J. Math.* 13 (2009), no. 2B, 753–755.

Ferrer, A.; Martínez-Legaz, J. E.: Improving the efficiency of DC global optimization methods by improving the DC representation of the objective function. *J. Global Optim.* 43 (2009), no. 4, 513–531.

Martínez-Legaz, J. E.: Some generalizations of Rockafellar’s surjectivity theorem. *Pac. J. Optim.* 4 (2008), no. 3, 527–535.

Dutta, J.; Martínez-Legaz, J. E.; Rubinov, A. M.: Monotonic analysis over cones. III. *J. Convex Anal.* 15 (2008), no. 3, 561–579.

Martínez-Legaz, J. E.; Singer, I.: Comparing Fenchel-Moreau conjugates with level set conjugates. *J. Convex Anal.* 15 (2008), no. 2, 285–297.

Martínez-Legaz, J. E.; Svaiter, B.F.: Minimal convex functions bounded below by the duality product. *Proc. Amer. Math. Soc.* 136 (2008), no. 3, 873–878.

Martínez-Legaz, J. E.; Soubeyran, A.: A tabu search scheme for abstract problems, with applications to the computation of fixed points. *J. Math. Anal. Appl.* 338 (2008), no. 1, 620–627.

Martínez-Legaz, J. E.: Convex conjugation and duality for the solutions of a functional equation. *Vietnam J. Math.* 35 (2007), no. 4, 481–494.

Martínez-Legaz, J. E.; Martínón, A.: Boundedly connected sets and the distance to the intersection of two sets. *J. Math. Anal. Appl.* 332 (2007), no. 1, 400–406.

Hiriart-Urruty, J.-B.; Martínez-Legaz, J. E.: Convex solutions of a functional equation arising in information theory. *J. Math. Anal. Appl.* 328 (2007), no. 2, 1309–1320.

Martínez-Legaz, J. E.; Quah, John K.-H.: A contribution to duality theory, applied to the measurement of risk aversion. *Econom. Theory* 30 (2007), no. 2, 337–362.

Martínez-Legaz, J. E.; Sosa, W.: Duality for equilibrium problems. *J. Global Optim.* 35 (2006), no. 2, 311–319.

Martínez-Legaz, J. E.; Penot, J.-P.: Regularization by erasement. *Math. Scand.* 98 (2006), no. 1, 97–124.

Martínez-Legaz, J. E.; Singer, I.: Some conjugation formulas and subdifferential formulas of convex analysis revisited. *J. Math. Anal. Appl.* 313 (2006), no. 2, 717–729.

Martínez-Legaz, J. E.: Some characterizations of convex games. *Recent Advances in Optimization*, 293–303, Springer, Berlin, 2006.

López, M. A.; Martínez-Legaz, J. E.: Farkas-type theorems for positively homogeneous semi-infinite systems. *Optimization* 54 (2005), no. 4-5, 421–431.

Martínez-Legaz, J. E.; Rubinov, A.M.; Schaible, S.: Increasing quasiconcave co-radiant functions with applications in mathematical economics. *Math. Methods Oper. Res.* 61 (2005), no. 2, 261–280.

Martínez-Legaz, J. E.: On Brickman's theorem. *J. Convex Anal.* 12 (2005), no. 1, 139–143.

Martínez-Legaz, J. E.; Svaiter, B.F.: Monotone operators representable by l.s.c. convex functions. *Set-Valued Anal.* 13 (2005), no. 1, 21–46.

Martínez-Legaz, J. E.: Generalized convex duality and its economic applications. *Handbook of generalized convexity and generalized monotonicity*, 237–292, Springer, New York, 2005.

Dutta, J.; Martínez-Legaz, J. E.; Rubinov, A. M.: Monotonic analysis over cones. II. *Optimization* 53 (2004), no. 5-6, 529–547.

Dutta, J.; Martínez-Legaz, J. E.; Rubinov, A. M.: Monotonic analysis over cones. I. *Optimization* 53 (2004), no. 2, 129–146.

Hiriart-Urruty, J.-B.; Martínez-Legaz, J. E.: New formulas for the Legendre-Fenchel transform. *J. Math. Anal. Appl.* 288 (2003), no. 2, 544–555.

Martínez-Legaz, J. E.; Meseguer, A.: The indirect function of an NTU game. *Optimization and related topics, 3.* *J. Math. Sci. (N. Y.)* 116 (2003), no. 3, 3253–3265.

Getán, J.; Martínez-Legaz, J. E.; Singer, I.:  $(*, s)$ -dualities. *Optimization and related topics, 1.* *J. Math. Sci. (N. Y.)* 115 (2003), no. 4, 2506–2541

Bilbao, J. M.; Martínez-Legaz, J. E.: Some applications of convex analysis to cooperative game theory. Generalized convexity, generalized monotonicity, optimality conditions and duality in scalar and vector optimization. *J. Stat. Manag. Syst.* 5 (2002), no. 1-3, 39–61.

Daniilidis, A.; Martínez-Legaz, J. E.: Characterizations of evenly convex sets and evenly quasiconvex functions. *J. Math. Anal. Appl.* 273 (2002), no. 1, 58-66.

Martínez-Legaz, J. E.; Rubinov, A. M.; Singer, I.: Downward sets and their separation and approximation properties. *J. Global Optim.* 23 (2002), no. 2, 111-137.

Daniilidis, A.; Hadjisavvas, N.; Martínez-Legaz, J. E.: An appropriate sub-differential for quasiconvex functions. *SIAM J. Optim.* 12 (2001/02), no. 2, 407-420.

Martínez-Legaz, J. E.; Rubinov, A. M.: Increasing positively homogeneous functions defined on  $\mathbb{R}^n$ . *Acta Math. Vietnam.* 26 (2001), no. 3, 313-331.

Martínez-Legaz, J. E.; Volle, M.: Duality for d.c. optimization over compact sets. *Optimization theory (Mátraháza, 1999)*, 139-146, *Appl. Optim.*, 59, Kluwer Acad. Publ., Dordrecht, 2001.

Dragan, I.; Martínez-Legaz, J. E.: On the semivalues and the power core of cooperative TU games. *Int. Game Theory Rev.* 3 (2001), no. 2-3, 127-139.

Martínez-Legaz, J. E.; Théra, M.: A convex representation of maximal monotone operators. *J. Nonlinear Convex Anal.* 2 (2001), no. 2, 243-247.

Martínez-Legaz, J. E.; Singer, I.: Semi-spaces and bases of convexity systems in complete lattices. *Constructive, experimental, and nonlinear analysis (Limoges, 1999)*, 235-243, CMS Conf. Proc., 27, Amer. Math. Soc., Providence, RI, 2000.

Martínez-Legaz, J. E.: Optimización matemática y sus aplicaciones económicas. *Varia Mathematica* 1 (2000), 97-153.

Martínez-Legaz, J. E.: A new characterization of totally balanced games. *Topics in mathematical economics and game theory (Toronto, ON, 1995)*, 83-88, Fields Inst. Commun., 23, Amer. Math. Soc., Providence, RI, 1999.

Martínez-Legaz, J. E.; Volle, M.: Duality in d.c. programming: The case of several D.C. constraints. *J. Math. Anal. Appl.* 237 (1999), no. 1, 657-671.

Luc, D. T.; Martínez-Legaz, J. E.; Seeger, A.: Least deviation decomposition with respect to a pair of convex sets. *J. Convex Anal.* 6 (1999), no. 1, 115-140.

Martínez-Legaz, J. E.; Sach, P. H.: A new subdifferential in quasiconvex analysis. *J. Convex Anal.* 6 (1999), no. 1, 1-11.

Bajona-Xandri, C.; Martínez-Legaz, J. E.: Lower subdifferentiability in min-max fractional programming. *Optimization* 45 (1999), no. 1, 1-12.

Martínez-Legaz, J. E.: Lexicographic utility and orderings. *Handbook of Utility Theory. Volume 1. Principles*, 345-369, Kluwer Acad. Publ., Dordrecht, 1998.

Flores-Bazán, F.; Martínez-Legaz, J. E.: Simplified global optimality conditions in generalized conjugation theory. *Generalized convexity, generalized monotonicity: recent results (Luminy, 1996)*, 305-329, *Nonconvex Optim. Appl.*, 27, Kluwer Acad. Publ., Dordrecht, 1998.

Martínez-Legaz, J. E.; Singer, I.: On  $\Phi$ -convexity of convex functions. *Linear Algebra Appl.* 278 (1998), no. 1-3, 163-181.

Martínez-Legaz, J. E.: A duality theory for totally balanced games. *Proceedings of the IV Catalan Days of Applied Mathematics (Tarragona, 1998)*, 151-161, Univ. Rovira Virgili, Tarragona, 1998

Martínez-Legaz, J. E.; Singer, I.: On conjugations for functions with values in extensions of ordered groups. *Positivity* 1 (1997), no. 3, 193-218.

Martínez-Legaz, J. E.: Lexicographical characterization of the faces of convex sets. *Acta Math. Vietnam.* 22 (1997), no. 1, 207-211.

Martínez-Legaz, J. E.; Singer, I.: An extension of d.c. duality theory, with an appendix on  $*$ -subdifferentials. *Optimization* 42 (1997), no. 1, 9-37.

Martínez-Legaz, J. E.: Characterization of  $R$ -evenly quasiconvex functions. *J. Optim. Theory Appl.* 95 (1997), no. 3, 717-722.

Martínez-Legaz, J. E.: Dual representation of cooperative games based on Fenchel-Moreau conjugation. *Optimization* 36 (1996), no. 4, 291-319.

Martínez-Legaz, J. E.; Théra, M.:  $\varepsilon$ -subdifferentials in terms of subdifferentials. *Set-Valued Anal.* 4 (1996), no. 4, 327-332.

Martínez-Legaz, J. E.: On the uniqueness of perfect matchings in bipartite graphs. *Exposition. Math.* 14 (1996), no. 5, 473-480.

Martínez-Legaz, J. E.; Santos, M. S.: On expenditure functions. *J. Math. Econom.* 25 (1996), no. 2, 143-163.

Coutat, P.; Volle, M.; Martínez-Legaz, J. E.: Convex functions with continuous epigraph or continuous level sets. *J. Optim. Theory Appl.* 88 (1996), no. 2, 365-379.

Martínez-Legaz, J. E.: On convex and quasiconvex spectral functions. Proceedings of the 2nd Catalan Days on Applied Mathematics (Odeillo, 1995), 199-208, Collect. Études, Presses Univ. Perpignan, Perpignan, 1995.

Martínez-Legaz, J. E.; Singer, I.: Dualities associated to binary operations on  $\overline{\mathbb{R}}$ . J. Convex Anal. 2 (1995), no. 1-2, 185-209.

Martínez-Legaz, J. E.: Fenchel duality and related properties in generalized conjugation theory. International Conference in Applied Analysis (Hanoi, 1993). Southeast Asian Bull. Math. 19 (1995), no. 2, 99-106.

Martínez-Legaz, J. E.; Singer, I.: Subdifferentials with respect to dualities. ZOR-Math. Methods Oper. Res. 42 (1995), no. 1, 109-125.

Crouzeix, J.-P.; Martínez-Legaz, J. E.; Seeger, A.: An alternative theorem for quadratic forms and extensions. Linear Algebra Appl. 215 (1995), 121-134.

Martínez-Legaz, J. E.; Singer, I.: \*-dualities. Optimization 30 (1994), no. 4, 295-315.

Martínez-Legaz, J. E.; Seeger, A.: A general cone decomposition theory based on efficiency. Math. Programming 65 (1994), no. 1, Ser. A, 1-20.

Martínez-Legaz, J. E.; Seeger, A.: Yuan's alternative theorem and the maximization of the minimum eigenvalue function. J. Optim. Theory Appl. 82 (1994), no. 1, 159-167.

Boncompte, M.; Martínez-Legaz, J. E.: Weak lower subdifferentiability in fractional programming. Int. Trans. Oper. Res. 1 (1994), no. 2, 265-270.

Martínez-Legaz, J. E.; Singer, I.: Some characterizations of perturbational dual problems. Optimization 29 (1994), no. 2, 97-130.

Martínez-Legaz, J. E.; Romano-Rodríguez, S.:  $\alpha$ -lower subdifferentiable functions. SIAM J. Optim. 3 (1993), no. 4, 800-825.



Marchi, E.; Martínez-Legaz, J. E.: A generalization of Fan-Browder's fixed point theorem and its applications. *Topol. Methods Nonlinear Anal.* 2 (1993), no. 2, 277-291.

Martínez-Legaz, J. E.; Santos, M. S.: Duality between direct and indirect preferences. *Econom. Theory* 3 (1993), no. 2, 335-351.

Martínez-Legaz, J. E.; Singer, I.: Some further characterizations of unperturbational dual problems. *Parametric optimization and related topics, III* (Güstrow, 1991), 407-436, *Approx. Optim.*, 3, Lang, Frankfurt am Main, 1993.

Martínez-Legaz, J. E.; Romano-Rodríguez, S.: Lower subdifferentiability of quadratic functions. *Math. Programming* 60 (1993), no. 1, Ser. A, 93-113.

Martínez-Legaz, J. E.: Axiomatic characterizations of the duality correspondence in consumer theory. *J. Math. Econom.* 22 (1993), no. 6, 509-522.

Martínez-Legaz, J. E.; Singer, I.: Some characterizations of surrogate dual problems. *Optimization* 24 (1992), no. 1-2, 1-11.

Crouzeix, J.-P.; Martínez-Legaz, J. E.; Seeger, A.: Un théorème de l'alternative pour des formes quadratiques et quelques extensions. (French) [An alternative theorem for quadratic forms and extensions] *C. R. Acad. Sci. Paris Sér. I Math.* 314 (1992), no. 7, 505-506.

Martínez-Legaz, J. E.; Seeger, A.: A formula on the approximate subdifferential of the difference of convex functions. *Bull. Austral. Math. Soc.* 45 (1992), no. 1, 37-41.

Marchi, E.; Martínez-Legaz, J. E.: Some results on approximate continuous selections, fixed points and minimax inequalities. *Fixed point theory and applications* (Marseille, 1989), 327-343, *Pitman Res. Notes Math. Ser.*, 252, Longman Sci. Tech., Harlow, 1991.

Martínez-Legaz, J. E.: Characterizations of efficient solutions under polyhedrality assumptions. *Z. Oper. Res.* 35 (1991), no. 3, 221-230.

Martínez-Legaz, J. E.; Singer, I.: Some characterizations of  $\varphi$ -Lagrangian dual problems. *Optimization* 22 (1991), no. 6, 835-843.

Martínez-Legaz, J. E.; Singer, I.: Multi-order convexity. *Applied geometry and discrete mathematics*, 471-488, DIMACS Ser. Discrete Math. Theoret. Comput. Sci., 4, Amer. Math. Soc., Providence, RI, 1991.

Boncompte, M.; Martínez-Legaz, J. E.: Fractional programming by lower sub-differentiability techniques. *J. Optim. Theory Appl.* 68 (1991), no. 1, 95-116.

Martínez-Legaz, J. E.; Singer, I.: Compatible preorders and linear operators on  $\mathbb{R}^n$ . *Linear Algebra Appl.* 153 (1991), 53-66. Erratum: *Linear Algebra Appl.* 220 (1995), 5-6.

Martínez-Legaz, J. E.; Singer, I.:  $\vee$ -dualities and  $\perp$ -dualities. *Optimization* 22 (1991), no. 4, 483-511. Errata corrigé: *Optimization* 24 (1992), no. 1-2, 13.

Martínez-Legaz, J. E.: Duality between direct and indirect utility functions under minimal hypotheses. *J. Math. Econom.* 20 (1991), no. 2, 199-209.

Martínez-Legaz, J. E.: Uniform approximation by classes of functions closed under translation and pointwise supremum. *Numer. Funct. Anal. Optim.* 11 (1990), no. 9-10, 967-986 (1991).

Martínez-Legaz, J. E.; Singer, I.: A characterization of Lagrangian dual problems. *Note Mat.* 10 (1990), suppl. 2, 389-394.

Martínez-Legaz, J. E.: Generalized conjugation and related topics. Generalized convexity and fractional programming with economic applications (Pisa, 1988), 168-197, *Lecture Notes in Econom. and Math. Systems*, 345, Springer, Berlin, 1990.

Martínez-Legaz, J. E.: Weak lower subdifferentials and applications. *Optimization* 21 (1990), no. 3, 321-341.

Martínez-Legaz, J. E.; Singer, I.: Dualities between complete lattices. *Optimization* 21 (1990), no. 4, 481-508.

Martínez-Legaz, J. E.; Singer, I.: Lexicographical order, lexicographical index, and linear operators. *Linear Algebra Appl.* 128 (1990), 65-95.

Martínez-Legaz, J. E.: On lower subdifferentiable functions. *Trends in mathematical optimization* (Irsee, 1986), 197-232, *Internat. Schriftenreihe Numer. Math.*, 84, Birkhäuser, Basel-Boston, MA, 1988.

Martínez-Legaz, J. E.: Quasiconvex duality theory by generalized conjugation methods. *Optimization* 19 (1988), no. 5, 603-652.

Martínez-Legaz, J. E.; Singer, I.: The structure of hemispaces in  $\mathbb{R}^n$ . *Linear Algebra Appl.* 110 (1988), 117-179.

Martínez-Legaz, J. E.: Lexicographical order and duality in multiobjective programming. *European J. Oper. Res.* 33 (1988), no. 3, 342-348.

Martínez-Legaz, J. E.; Singer, I.: Lexicographical separation in  $\mathbb{R}^n$ . *Linear Algebra Appl.* 90 (1987), 147-163.

Martínez-Legaz, J. E.; Singer, I.: Surrogate duality for vector optimization. *Numer. Funct. Anal. Optim.* 9 (1987), no. 5-6, 547-568.

Martínez-Legaz, J. E.: Level sets and the minimal time function of linear control processes. *Numer. Funct. Anal. Optim.* 9 (1987), no. 1-2, 105-129.

Martínez-Legaz, J. E.: Some new results on exact quasiconvex duality. IX symposium on operations research. Part I. Sections 1-4 (Osnabrück, 1984), 47-62, *Methods Oper. Res.*, 49, Athenäum/Hain/Hanstein, Königstein/Ts., 1985.

Martínez-Legaz, J. E.: Lexicographical order, inequality systems and optimization. System modelling and optimization (Copenhagen, 1983), 203-212, Lecture Notes in Control and Inform. Sci., 59, Springer, Berlin-New York, 1984.

Martínez-Legaz, J. E.: A new approach to symmetric quasiconvex conjugacy. Selected topics in operations research and mathematical economics (Karlsruhe, 1983), 42-48, Lecture Notes in Econom. and Math. Systems, 226, Springer, Berlin-New York, 1984.

Martínez-Legaz, J. E.: Exact quasiconvex conjugation. Z. Oper. Res. Ser. A-B 27 (1983), no. 7, A257-A266.

Martínez-Legaz, J. E.: A generalized concept of conjugation. Optimization: theory and algorithms (Confolant, 1981), 45-59, Lecture Notes in Pure and Appl. Math., 86, Dekker, New York, 1983.

Martínez-Legaz, J. E.: Conjugation associated with a graph. (Spanish) Proceedings of the ninth Spanish-Portuguese conference on mathematics, 2 (Salamanca, 1982), 837-39, Acta Salmanticensia.